

Presentation Florence April 15th 2002

Event:

**Quality of Fish in the Supply Chain:
Labelling, Monitoring and Traceability**

Presentation:

“Traceability drivers in the fish supply chain”

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Focus on traceability



- Hits on 'traceability' in newspaper articles - up on average 1200% from 1999 onwards
- Hits on 'traceability' in research projects and scientific articles - up 500% since 1999
- Consumer awareness, product labelling
- Implementation projects, industry awareness
- Research programmes, international and national
- Legislation

This presentation

 **Traceability and food safety**

 **Competitive advantages
through traceability**

 **The TraceFish project,
the TraceFood project**

Definition - ISO 8402



Traceability:

Ability to trace the history, application or location of an entity by means of recorded identifications.

In a product sense, it may relate to

- the origin of materials and parts
- the product processing history
- the distribution and location of the product after delivery

Recorded identifications



How do I access these recorded identifications?

- ➔ I record what I am doing, the resources used, the process parameters, etc. I have my own local database in the farm, vessel, plant, container, etc.
- ➔ I get the data from previous links in the chain, the information is passed along with the fish/product. The data is transmitted on the label or in the accompanying documentation (paper, fax, E-mail, phone, etc.)

Types of traceability

→ Internal traceability

Your own data

→ Chain traceability

The data you get (and give)

Traceability control mechanisms

Methods and instruments used for authentication and testing that what we receive is what the documentation says.

Internal traceability:



- within one company
- same geographical location
- interface to production management systems
- few privacy issues
- simpler to do, and some companies have good systems

Chain traceability:



- between companies
- between countries
- depends on internal traceability being present
- major privacy issues
- standards needed
- relatively new field

Traceability and food safety



In the first week of January 1999 a car demolition company in Wallonia, Belgium delivers oil from a transformer to a municipal oil recycling plant.

The oil contains about 1 gram of dioxin.

For some unknown reason, the oil ends up in a vegetable oil storage tank.

Winter 1999:



- Jan: 'oil' company collects from tank, sells oil to 'fat' company
- Jan: 'fat' company produces vegetable fat from oil, sells to feed company
- Jan: feed company produces chicken feed from fat, distributes feed to 1600 chicken farms in Belgium, France, Netherlands and Germany
- Feb: egg producers notice chicken sickness and reduced egg quality
- Mar: complaints, government and insurance companies get involved
- Mar: feed company stops selling feed and reports 'fat' company to the police

Spring 1999:



- Apr: dioxin is identified as contaminant
- Apr: feed production stops
- Apr: neighbouring countries informed
- May 27th: first press statement issued
- May 28th: all Belgian egg and poultry products removed from shelves
- May 28th: Press accuses government of cover-up
- May 31st: All imports stopped

Summer 1999:



- Jun 2nd: EU commission stops sale of products that are -, or may be contaminated
- Jun 2nd: Management of 'fat' company arrested
- Jun 17th: Management of 'oil' company arrested
- Jun: Belgian minister of agriculture and minister of health forced to resign.
Government survived, but had a terrible election result later in the summer. The main issue in the election was the handling of this case. Green party election winners.

Aftermath:



- 4 feed plants closed for good, 3 of them had never produced contaminated feed, 1 of them was not even in the same company, but demand for feed from Belgium dropped to practically zero
- EU commission estimated the direct economic loss as a result of these events at least to be 1500 million Euro, over 1300 million USD

On reflection



This food scandal was not horrendous in effect. Very few people became ill, and then only mildly and temporarily. Very few animals were harmed.

The problem with the Belgian dioxin scandal was the scope. Few companies or farmers kept records of which ingredients or feed they used. Fewer still kept track of the production date or batch identifier. Thus any form of targeted recall was impossible, and the scandal couldn't be contained.

The Hudson Foods case



In early July 1997, Hudson Foods Company in Arkansas, US started receiving reports of illness related to consumption of their beef patties. 16 consumers were affected, 5 of them were hospitalised, all recovered.

E.coli 0157:H7 was identified as the bacteria. This is normally not deadly, but may be very dangerous to children, elderly and those with compromised immune systems.

A slaughterhouse was identified as the source of contamination. The contaminated raw material had been used as input on one particular day of production.

August 1997:



- August 12th: Voluntary nationwide recall was issued for 10 tons of beef patties, from three specified products with production dates '155' and '156'.
- August 14th: One documented case of E.coli contamination related to consumption of beef patties produced at a later date is reported. Hudson recalls 10 more tons, for a total of 20.
- August 15th: Federal inspectors move in. Recall issued for 600 tons.
- August 21st: After studying Hudson production methods and documentation, federal inspectors order the recall of 12.000 tons.

Quote from federal report:



.. the reason for the addition recall is that Hudson took leftover raw materials from one day's production and used them in the next day's production.

Inspectors could not determine if materials used during the period in early June ... might have found their way into subsequent production days. So the decision was made to close the plant, destroy all product on hand, and recall any Hudson hamburger from Columbus still on the market.

Food for thought



- Hudson Foods went bankrupt as a result of this, even though only one of their plants were involved
- Listeria would be the threat in the fish industry. Listeria is more dangerous than E.coli, and unlike E.coli the bacteria grow even under refrigeration.
- Anyone in the fish industry use "leftover raw materials from one day's production ... in the next day's production"?

On reflection



Keeping track of production date and batch identifier doesn't help if the producer cannot relate the production batch to input batches.

The production batch must be of limited size, it must be related to a finite set of input batches, and this relation ("transformation") must be explicitly documented.

Other food scandals



- Salmonella poisoning
- Mad cow disease
- Creutzfeldt-Jacob syndrome
- Foot-and-mouth disease
- Scrapie
- Numerous expensive 'almost-accidents' where the contamination was discovered earlier so quiet 'withdrawal' (rather than public recall) was effected

Legislation - 1



“EU regulation on the common organisation of fishery markets”, January 2002 (in effect now)

- **Must specify:** species, production method (sea, inland, farmed) and area of origin
- **Applies to:** living, fresh, dried, salted, in brine, smoked and cooked fish, sold separately or prepackaged; also shellfish
- **Does not apply to:** canned fish, secondary processed fish, small quantities sold directly from fisherman to consumer

EC 104/2000 and EC 2065/2001

Legislation - 2



“Product Safety Directive”, January 2003 (proposal)

- **Requires:** producer must have documented routines for recall
- **Applies to:** all products to consumer

92/59/EC

“Hygiene of Foodstuffs Directive”, 2004 (proposal)

- **Requires:** documented traceability for all links in the foodchain (very likely ‘one-up, one-down’)
- **Applies to:** all producers of foodstuffs

93/43/EC

Legislation - 3



- 50+ EU documents of this type are either in effect or in the pipeline
- FAO has catch certification as a main priority
- national legislation for products, for foodstuffs, for consumer protection, for labelling
- reports to the government, statistics, customs, tax and duty calculation

Chain traceability is required!

Other traceability drivers



- Competitive advantage for producer, processor, transporter and retailer
- Demands from consumer
- Availability of mature technology
- National and international organisations, standardisation bodies, certification bodies, environmental organisations, other NGO's

Producer (catch/farming)

- the data that is recorded anyway can be tied to the raw material / product, very little data handling problem as very little data is received
- better payment for better quality
- remote (electronic) auction of catch
- possible to tailor products
- better feedback from immediate customers and also from further down the chain
- documentation of 'no fault'
- possible to trace back to source of error, surgical recall if something goes wrong

Processor and transporter



- reduced costs in connection with information logistics, less re-punching
- better quality control, check received goods against ordered
- more information gives better opportunity to find out how different properties influence quality and yield; optimising production
- product information builds customer loyalty
- documentation of 'no fault'
- possible to trace back to source of error, surgical recall if something goes wrong

Retail



- increased supplier safety
- makes certification of suppliers and decentralised quality control possible
- determination of responsibility / fault
- profiling of particular product characteristics
- product information builds consumer loyalty
- access to new value adding data, i.e.
documentation of unbroken cooling chain and
better estimation of remaining shelf life

Consumer



- shows clear preference for better documented products, even at higher price
- can give priority to niche products, products with particular origin or properties
- documentation of ingredients and additives throughout the chain
- ecological products
- ethical products

Technology



- physical marking of fish now possible; snout marks, chemical tags, genetic marking, temperature variance marking, etc.
- internationally established number series for globally unique product and batch identification
- versatile code carriers with low read time; barcodes, radio-frequency tags (RF-tags), etc
- internet technology for standardised dissemination of data without special software

Organisations



- UN, FAO; Codex Alimentarius
- National and international industry organisations and industry standards
- Retailers organisations, retailers standardised requirements; CIES, EUREP-GAP
- Standardisation and certification bodies and processes; ISO, CEN, SGS, Efsis, Veritas
- Environmental organisations; Greenpeace, WWF

Conclusion



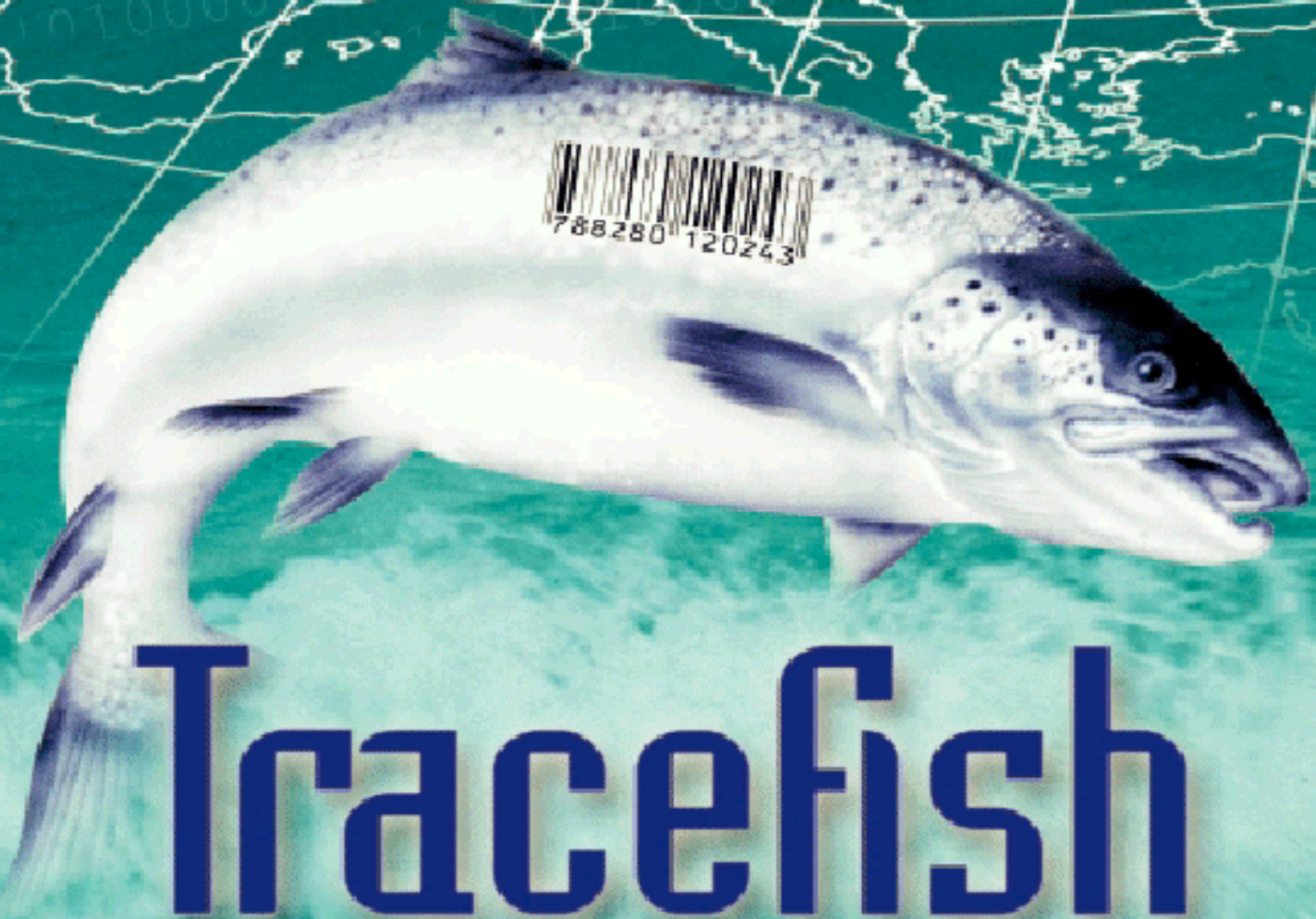
Traceability is more than food safety

Companies with routines and systems for chain traceability in place will have a significant competitive advantage over those without.

Why electronic transmission?




With increasing information demands from buyers and consumers of food products, it is no longer practical to transmit all the relevant data physically along with the product. A more sensible approach is to mark each package with a unique identifier, and then transmit or extract all the relevant information electronically.



Tracefish


Traceability of Fish Products

TRACEFISH - objective



We want to establish broad consensus among research and industry for what traceability data should be recorded and transmitted for fish products, and how these data should be coded electronically. This consensus will be documented in the form of three standards, for voluntary use in the industry.


TRACEFISH - conferences



1. "State of the art", with Nordic project, Copenhagen, May 22. 2001 (also 21./23.)
2. "Data content", with CA-FQLM, Nantes, September 2001
3. "Technical", Amsterdam, March 2002
4. "Standards and implementation projects based on them", Consensus conference, **November 7th 2002, Malaga, Spain**

See www.tracefish.org

TRACEFISH - standards



The standards will describe:

- ⌘ for full-chain traceability, what data should be recorded how and where in the captured fish chain.
- ⌘ for full-chain traceability, what data should be recorded how and where in the farmed fish chain.
- ⌘ how should these data be coded, transmitted or made available in electronic form, what (existing) electronic standard should be chosen to facilitate the dissemination of these data.

See *www.tracefish.org*

Captured fish standard - draft

	Shall	Should	May
INFORMATION ON THE VESSEL			
Vessel ID	V	V	V
Master	V	V	V
Vessel GMP accreditation			V
Fishing method		V	V
Stowage method			V
Temperature control method			V
Vessel temperature record		V	V
FOR EACH UNIT LANDED			
Place of landing	V	V	V
Date and time of landing	V	V	V
ID of next food business operator to whom the unit is landed (transporter, auction or processor, etc.)	V		V

Description of Unit			
Unit ID	V		V
Type of unit	V		V
Species	V	V	V
Product form	V	V	V
Temperature condition	V		V
Size grade			V
Size grading method			V
Weight	V	V	V
Weighing method			V
Fishing area	V	V	V
Date and time of capture (or date of sailing if date of capture not provided?)	V	V	V
Trawl towing time or fixed gear soak time			V
Ethical aspects			V

Farmed fish standard - draft

Shall	Examples
Specie	Salmon salar
Company name	Salmon Broodstock Ltd.
Batch number	9876543098

Should	Examples
Farm name	Ova Bay Station
Localization farm/plant	County/area, longitude/latitude
Company authorization number	123456789
Estimated quantity of selection/(per batch received) (L/nr/Kg)	Amount of eggs: 200 L or number of eggs: 1.100.000 pcs
Medication name record	Name of medication used
Medication time record	Last date of use per medication
Disease name record	Name of diagnosis,
Disease time record	Date reported off the sick list

May	Examples
Date and time of selection/(per batch received)	27.11.01
Disinfecting record	Disinfecting type, method and date
Weight of parental fish	15 Kg
Age of parental fish	3 year
Genetic ID (Traceability of family)	MOWI 2001-34
Spawning date	27.11.01
oC days from spawning	Sum of average temperature pr day
Water temperature at time of selection	7,5°C

Underlying design philosophy



Keeping track of batches and their properties is the key to implementing chain traceability.

We must record what batches we use, we must have the ability to access their properties, and we must relate input batches and properties to the batches we make (in addition to our own internal traceability data, of course)

What next?



Feedback on TraceFish standardisation work very positive.

Meetings between TraceFish management group and legislators planned.

Recent initiative to establish TraceFood project (expression of interest) for standardisation of electronic transmission of traceability data for food in general.

Follow progress on www.tracefood.org (from June)

TraceFood - objective



We want to establish broad consensus within the food industry for what traceability data should be recorded and transmitted for food products, and how these data should be coded electronically. This consensus will be documented in the form of standards, for voluntary use in the industry.

TraceFood - goals



- to standardise the electronic coding and transmission of traceability data in the food industry
- to specify an infrastructure, a TraceFoodNet, to be used for exchanging information about food products
- to standardise terms and denominations between foodchains where possible
- to further the cause of chain traceability of food products in general by providing a common forum where problems can be solved and from which implementation projects can be launched

The end:



Thank you